ATOMIC ENERGY newsletter®

A SERVICE FOR INDUSTRY BUSINESS ENGINEERING AND RESEARCH
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Dear Sir:

New high in net assets of $56,253,228 as of Sept. 30, 1958 has been reached by Atomic Development Mutual Fund, Inc., the firm reported last week. This was equal to $5.04 each on 11,476,626 shares and compared with $48,577,551 or $4.62 each on 10,497,525 shares outstanding a year earlier. (On Dec. 31, 1957 the Fund had net assets of $45,108,549 or $4.15 a share on 10,855,527 shares.) Acquired by the Fund during the quarter were new holdings in Detroit Edison Co., and Northern States Power Co. It eliminated from its portfolio shares in Algom Uranium Co., Boeing Airplane Co., Four Corners Uranium Co., and Garrett Corp.

Production and delivery of more than 5,000 fuel elements for Brookhaven National Laboratory's research reactor has been completed by Sylvania-Corning Nuclear Corp., under a $250,000 contract. The new elements, containing 93% enriched uranium-aluminum alloy clad in aluminum, have converted the air-cooled graphite-moderated reactor from natural to enriched uranium, and will give a six-fold increase in neutron density. Other advantages of the new elements include lowering of the total reactor heat output from 24 to 20 megawatts; a decrease in the amount of cooling air required; up to four times as much burn-up; and reduced reactor fuel inventory with only one-seventh as much fuel required for the operation of the reactor. (Other CONTRACT NEWS, p. 4 this LETTER.)

First formal request has been received by the International Atomic Energy Agency (IAEA) from a member state--Japan--for a supply of nuclear source materials, IAEA recently reported to the U.N. General Assembly. The supply of fissionable and source materials was one of the major functions for which the Agency was established; so far, a total of 5,140 kg of contained uranium-235 has been offered by member states for the Agency's operations.

A $9,600,000 expansion of Oak Ridge National Laboratory, which involves additions to the Central Research Laboratory and the Instrument Laboratory there, has reached the planning stage, according to S. R. Sapirie, manager of the USAEC's Oak Ridge operations office. Gross area of the two additions will be about 287,000 square feet. (Other NEWS OF EXPERIMENTAL FACILITIES, p. 2 this LETTER.)

Controlled Thermonuclear Power will be discussed Jan. 29, 1959 at Northwestern University, Evanston, Ill., as part of the Gas Dynamics Colloquium there under the aegis of the University's department of mechanical engineering. Milton U. Clauser, who is director of the physical research laboratory of Ramo-Wooldridge Corp., will present an outline of results of thermonuclear power research and some new approaches to controlled fusion. (Other MEETINGS, COURSES, CONFERENCES, p. 5 this LETTER.)

Two retention tank monitoring systems are now being built by Tracerlab, Inc., for the Instituto Venzolano de Investigaciones Certificos, Caracas, Venezuela. For the Institute's new research reactor and laboratories now being built in Caracas, the systems will provide automatic and continuous radiation monitoring. (Other MANUFACTURERS' NEWS, p. 3 this LETTER.)

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ATOMIC ENERGY BUSINESS NEWS...

NUCLEAR RESEARCH FACILITY DEDICATED:- The first European nuclear reactor to be built expressly for marine applications was dedicated last fortnight at Hamburg, Germany. Owned and operated by the Society for the Utilization of Nuclear Energy in Ship-building and Navigation, Inc., the combined nuclear reactor and research facility is the largest of its type ever built according to Babcock & Wilcox Co., New York, designer and supplier of the major reactor components. The research unit, 89-ft. long and 29-ft. wide, is unique in that it has four pools built in series instead of the more conventional double pool. Two of the pools are capable of sustaining reactor operation at 5000 kw capacity. The reactor will utilize B&W-fabricated fuel elements containing 20% enriched uranium-235, which is the usual maximum concentration permitted by the U. S. for shipment abroad.

MASS PRODUCTION & INSTALLATION OF NUCLEAR POWER PLANTS PROPOSED:- A proposal to produce and install for operation by electric utility companies some 50 or more 5,000 kw nuclear power plants was discussed last week in New York by Francis K. McCune, vice-president and general manager of General Electric Company's atomic products division; called Operation Know-How, it was one phase of a two-part plan to make nuclear power competitive with conventional power by 1970 and in some parts of the U.S. by 1965. General Electric would make and sell about 25 of the boiling water reactor plants and is suggesting that utilities buy another 25 from other manufacturers. Main purpose of the plants, which would cost between $4 million and $4½ million to install, would be to help utilities train personnel and get acquainted with atomic operating problems. The other phase of the plan, called Operation Sunrise, envisions sale by GE by 1962 of at least four medium-sized nuclear power plants to utilities for a total cost of about $90 million. The plants would range in price from $12.5 million to $36 million. At a later stage, GE wants to build between 1962 and 1970 six very large plants; their cost is estimated at $400 million. The company believes that through continual engineering improvements it may bring electric generating costs down to 8.5 mills per kwh by 1965, and 6.5 mills by 1970.

RESEARCH PROJECTS...and experimental work...

DIRECT HEAT-TO-ELECTRICITY CONVERSION:- Plasma thermocouple, developed at Los Alamos Scientific Laboratory, may possibly provide practical heat-to-electricity directly. The device uses a gas plasma, with a metal electrode, rather than the conventional metal-metal thermocouple. Developed by a group in the Laboratory's N Division, which is concerned with nuclear propulsion for rockets, conversion efficiencies of 2 to 5% have been obtained. Plasma used is cesium vapor, with tantalum electrode. In small scale experiments, voltages of 2-volts have been obtained. Ultimate objectives are to create what might be called a nuclear reactor-plasma thermopile. In such a reactor, the heat of fission would be converted directly into electrical energy.

NEW EXPERIMENTAL FACILITIES:- Cornell University, Ithaca, N.Y., and University of Arizona, Tucson, are to receive permits from the USAEC for reactors which they propose to install for teaching and research. Cornell's facility will be a pool-type light water moderated reactor of 10 thermal kw capacity. To have a dual core, a single system of instruments will permit operation of only one core at a time; members of the staff of Cornell developed the dual-core design. Vitro Engineering Co. has been engaged to develop further design, modifications and calculations for the reactor project.

Facility proposed to be constructed by the University of Arizona is a heterogeneous, tank-type reactor cooled by light water and moderated by zirconium hydride and water. It is designed to operate continuously at a thermal power level of 10 kw and at levels up to 30 thermal kw for short periods. The reactor, of the Triga type developed by General Dynamics Corp., will be bought from that company by the University.

Largest privately-owned metallurgical research and development laboratory in the U. S. was opened in Concord, Mass., last fortnight with dedication there of Nuclear Metals, Inc., new $2 million facility. Originally formed in 1942 as the Metallurgical Project of Massachusetts Institute of Technology, it continued under MIT auspices until 1954 when Arthur D. Little, Inc., and Allegheny Ludlum Steel Corp. jointly continued the activities of the Metallurgical Project under USAEC contracts. In addition to serving as prime contractor to the USAEC in research and development of new materials, Nuclear Metals has carried out extensive work for the Defense Department and industrial firms.

NEW PRODUCTS, PROCESSES, INSTRUMENTS...for nuclear lab & plant...

NEW PRODUCTS FROM MANUFACTURERS:- Predetermined level gauge, Model 40105, indicates presence or absence of liquid at pre-set level. Scintillation detector, located outside tank containing the liquid, detects and records the strength of radioactivity of the source which is on a horizontal plane with the detector at the desired level. The source may be either inside or outside the tank. --Radiation Counter Laboratories, Inc., Skokie, Ill.

PRODUCT NEWS:- Orlando Research Inc., Orlando, Fla., is now offering from stock dimethyl formamide, in addition to its other radiochemicals.

Amendment of the USAEC's byproduct material licensing regulations is proposed as published in the Federal Register, Oct. 31, 1958. It would exempt from licensing requirements the receipt, possession, use, transfer, ownership or acquisition of by-product material in specified low concentrations but would prohibit licensees from making such transfers without prior Commission approval. The amendment includes a schedule of the maximum amounts of byproduct materials that may be concentrated in license-exempt articles or preparations.

MANUFACTURERS' NEWS:- At new facilities in Metropolis, Ill., Allied Chemical Corp. has started full-scale production of liquid fluorine. A uranium hexafluoride plant now under construction there, to be completed next year, will use most of the output. Under Allied's five year contract with the USAEC, it will supply 5000 tons per year of uranium hexafluoride beginning April 1, 1959.

MANUFACTURERS' LITERATURE:- The CE-15 whole body scanner now being marketed in the U. S. by Tracerlab, Inc., Waltham, Mass., is described in that company's October, 1958, issue of Tracerlog.

First in a new series of technical bulletins being issued by Nuclear-Chicago Corp., 223 W. Erie St., Chicago 10, Ill., discusses radioisotopic yield determination in quantitative analysis.

PEOPLE...in atomic energy work...

Eugene P. Wigner has been selected by the USAEC to receive its Enrico Fermi award. Dr. Wigner, Professor of Mathematical Physics at Princeton University, who did early theoretical work in nuclear physics with Dr. Fermi, receives the award "for contributions to nuclear and theoretical physics, to nuclear reactor development, and to practical applications of atomic energy".

Frank K. Pittman has been appointed director of the USAEC's Division of Reactor Development which has been reorganized to additionally handle all work formerly embraced by the Commission's Office of Industrial Development, except for isotope development.

Kenneth J. Culp has been named manager of marketing for the atomic fuel department of Westinghouse Electric Corp., Pittsburgh, Pa.

NEW BOOKS & OTHER PUBLICATIONS...

Radioactive Isotopes in Clinical Practice, by Edith H. Quimby, S. Feitelberg, and S. Silver. In three parts; part I covers basic physics of radioisotopes, part II deals with instrumentation for isotope use in actual practice, and part III presents clinical applications. 451 pages. --Lea & Febiger, Washington Sq., Phila. 6, Pa. ($10.00)

Philosophy of Atomic Physics, by Joseph Mudry. Presentation of a new philosophical order. 136 pages. --Philosophical Library, 15 E. 40th St., New York, N.Y. ($3.75)

Bibliography on Photographic Film Dosimetry, by G. H. H. Griffith, Materials Laboratory, Air Research & Development Command. Publications issued through 1957 on photographic film dosimetry. No. PB-151026. --Office of Technical Services, Wash. 25, D.C. (75¢).

Introduction to Nuclear Engineering, by Richard Stephenson. Revised, second edition of this text, with new chapters on reactor core design and thermonuclear reactions. Emphasis is on engineering practices unique to nuclear engineering. 491 pages. --McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N.Y. ($9.50)

Nuclear Science & Technology. 236 pages. ($4.00)..... Bibliographies of Interest to the Atomic Energy Program. 149 pages. ($3.00)..... The Shippingport Pressurized Water Reactor. 34 pages. ($1.25)..... Hot Laboratory Equipment, 2nd ed. 429 pages. ($2.50)..... Radioactive Waste Processing & Disposal. 123 pages, ($2.75) --U.S. Atomic Energy Commission, Wash. 25, D.C.

ATOMIC ENERGY WORK...outside the U. S. ...

UNITED KINGDOM:- Planning permission has been granted the U. K. Atomic Energy Authority for the building at Windscale, Cumberland, of an advanced gas cooled nuclear reactor which it is hoped will become the prototype of UK nuclear power stations to be ordered after 1962. Site clearing is underway, with completion date of 1961 established. The reactor will use beryllium canning and enriched fuel; use of the beryllium will permit gas outlet temperatures of 930-1050 deg. F., compared with 700 deg. F. at Hinkley Point. Use of the enriched fuel will enable heat output per given weight of fuel to be increased to between three and three and a half times that in the Hinkley Point design.

FRANCE:- The low-temperature heavy-hydrogen distillation plant of L'Air Liquide, at Toulouse, is now going onstream, the company has advised. The firm points out that its experience goes back to 1954, when it started its first pilot plant with a capacity of over 2 tons per year. At Toulouse it obtains its starting material, synthesis gas, from the large ammonia plant there. The company estimates that it is now able to design and erect a 40 ton per year heavy hydrogen plant, using its liquid hydrogen distillation method.

ATOMIC ENERGY CONTRACT NEWS...

PROPOSALS RECEIVED:- Some 86 proposals from 32 architect-engineering firms have been received by the USAEC for doing preliminary design and engineering studies and cost estimates on nuclear power plants using three reactor concepts: boiling water, pressurized water, and organic cooled. The proposals were in response to the Commission's invitation issued in September, 1958. A special contractor selection board at the USAEC's Idaho Falls, Idaho, office is evaluating the proposals. Thirty proposals covering the boiling water concept were submitted; 26 on the pressurized water concept; and 30 on the organic cooled concept. Purpose of the studies is to determine the design variation which would provide the most economical nuclear power station for each of the three types. Reports on the first phases of work under each contract must be submitted to the Commission by Mar. 23, 1959.

CONTRACTS AWARDED:- Design and development work in connection with rotating machinery for a marine nuclear power plant will be handled by Westinghouse Electric Corp. under a sub-contract from General Dynamics Corp., prime contractor on the job. The overall project concerns development of a nuclear propulsion plant for a merchant ship utilizing a gas cooled nuclear reactor, and is being sponsored jointly by the USAEC and the Maritime Administration. General Dynamics will design and develop the reactor at its General Atomic division, San Diego, Calif.; its Electric Boat division at Groton, Conn., will design and develop the propulsion plant. The work by Westinghouse, in connection with the rotating machinery, will be performed principally at that company's industrial gas turbine department, Philadelphia.

RAW MATERIALS...prospecting, mining, marketing...

UNITED STATES:- Producers in the U. S. should be paid at least as much for uranium concentrates as foreign producers receive from this country, Gordon Weller, executive vice president of the Uranium Institute of America told on Albuquerque, N. M. National Association of Manufacturers group last fortnight. Mr. Weller pointed out that foreign suppliers receive $1.53 more per pound than is paid for the same contained uranium in the U. S., and he asked for a parity to be established to eliminate the discrimination. The domestic industry has the status of an "unwanted chattel" he charged, and asked for immediate correction of faults in domestic uranium procurement programs.

CANADA:- Stanleigh Uranium Mining Corp. is now treating 2,000 tons of uranium per day at its plant near Elliot Lake, Northern Ontario, the firm reports, noting that mill heads are averaging just over 2.0 lbs. of uranium oxide per ton. The firm claims that its milling process is presently recovering 95% of uranium values in the ores it is processing. For the first quarter of the company's fiscal year, which started July 1, 1958, the mill treated 183,629 tons grading 2.05 lbs. of uranium oxide per ton, with a mill recovery rate of 95.01%.

With a capacity rate of 3,000 tons per day, Stanrock Uranium Mines is currently handling an average of 2,908 tons per day, at its plant near Elliot Lake, N. Ontario, a company official states. For the first 27 days of October, 1958, the company reports that mill heads averaged 1.66 lbs. of uranium oxide per ton. Mill recovery has been reported at 92.0%.

ATOMIC ENERGY PATENT DIGEST...

ISSUED October 28, 1958 to PRIVATE ORGANIZATIONS AND/OR INDIVIDUALS:- (1) Method of increasing the uniformity of dose produced by a beam of high energy electrons throughout the volume of irradiated objects. A. J. Gale, inventor. No. 2,858,441 assigned to High Voltage Engineering Corp., Cambridge, Mass. (2) Apparatus for increasing the uniformity of dose distribution produced by electron irradiation. D. R. Dewey, II, inventor. No. 2,858,442 assigned to High Voltage Engineering Corp., Cambridge, Mass. (3) Radioactive means and technique for integrating variable quantities. G. O. Burr, inventor. No. 2,858,449 assigned to Hawaiian Development Co., Ltd., Honolulu, Oahu, T.H. (4) Shutter system for radiation device. B. C. Holben, inventor. No. 2,858,450 assigned to Industrial Nucleonics Corp. (5) Laminar ray shielding materials. Herman I. Silversher, Los Angeles, Calif., inventor. No. 2,858,451 issued to inventor of record. (6) Electrostatic generator. L. E. Wilson, inventor. No. 2,858,460 assigned to High Voltage Engineering Corp., Burlington, Mass. (7) Radiation detectors. C. G. Ludeman, inventor. No. 2,858,465 assigned to Texaco Development Corp., New York, N.Y. (8) Irradiation of preformed polyamide resin. E. J. Lawton, A. M. Bueche, inventors. No. 2,858,259 assigned to General Electric Co.

ISSUED October 28, 1958 to GOVERNMENTAL ORGANIZATIONS:- (1) Secondary emission type of nuclear battery. E. G. K. Schwarz, inventor. No. 2,858,459 assigned to Secretary of the Army. (2) Coupling means for liquified-gas conduits. G. A. Bleyle, Jr., inventor. No. 2,858,146 assigned to USAEC. (3) Uranium recovery. F. T. Fitch, A. J. Cruikshank, inventors. No. 2,858,187 assigned to USAEC. (4) Extraction apparatus. A. E. Ballard, H. R. Brigham, inventors. No. 2,858,196 assigned to USAEC. (5) Separation of fluid mixtures. R. Lipscomb, A. Craig, S. Labrow, J. F. Dunn, inventors. No. 2,857,745 assigned to USAEC. (6) Protectively covered article and method of manufacture. R. F. Plott, inventor. No. 2,858,262 assigned to USAEC. (7) Radiation dosimeter and dosimetric methods. G. V. Taplin, inventor. No. 2,858,447 assigned to USAEC. (8) Radiation wave detector. L. F. Wouters, inventor. No. 2,858,452 assigned to USAEC.

ISSUED November 4, 1958 to PRIVATE ORGANIZATIONS AND/OR INDIVIDUALS:- (1) Method of electroradiography. M. L. Sugarman, Jr., inventor. No. 2,859,352 assigned to Radio Corp. of America. (2) Method and means for collecting electrical energy of nuclear reactions. J. H. Coleman, inventor. No. 2,859,361 assigned to Radiation Research Corp., W. Palm Beach, Fla. (3) Recovery of uranium from pitchblende ore. Charles E. Winters, inventor. No. 2,859,091 issued to inventor of record.

ISSUED November 4, 1958 to GOVERNMENTAL ORGANIZATIONS:- (1) Crucible lining method. W. H. Bone, W. W. Schmidt, inventors. No. 2,858,596 assigned to USAEC. (2) Solvent extraction process for recovery of metals from phosphoric acid. R. H. Bailes, R. S. Long, inventors. No. 2,859,092 assigned to USAEC. (3) Zirconium phosphate adsorption method. E. R. Russell, A. W. Adamson, J. Schubert, C. E. Boyd, inventors. No. 2,859,093 assigned to USAEC. (4) Uranium extraction process using synergistic reagents. J. M. Schmitt, C. A. Blake, Jr., K. B. Brown, C. F. Coleman, inventors. No. 2,859,094 assigned to USAEC. (5) Process of producing Cm-244 and Cm-245. W. M. Manning, M. H. Studier, inventors. No. 2,859,095 assigned to USAEC. (6) Process for production of uranium hexafluoride. R. D. Fowler, inventor. No. 2,859,096 assigned to USAEC. (7) Preparation of plutonium halides. N. R. Davidson, J. J. Katz, inventors. No. 2,859,097 assigned to USAEC. (8) Composition and method for coating a ceramic body. M. K. Blanchard, inventor. No. 2,859,138 assigned to USAEC. (9) Cadmium-rare earth borate glass as reactor control material. G. L. Ploetz, W. E. Ray, inventors. No. 2,859,163 assigned to USAEC.

MEETINGS, COURSES, CONFERENCES...

SYMPOSIUM:- First International Symposium on Nuclear Fuel Elements is now planned for January 29, 1959, at Columbia University, New York. The two day meeting is being sponsored by the University and Sylvania-Corning Nuclear Corp., Bayside, L.I. Sessions will be devoted to such topics as analyses of various types of fuel elements; fabrication techniques; corrosion problems; irradiation and cladding problems; engineering for low-cost fabrication; and economic considerations.

Sincerely,

The Staff,
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